REMARKS

Applicant is in receipt of the Office Action mailed July 14, 2006.

Claim Status

Claims 1-10, 13-17, 20-28, 30, and 32-41 were pending prior to the present amendment.

Claims 1-2, 14, 21, and 25 have been amended.

Claims 11-12, 18-19, 23-24, 29, and 31 have been cancelled.

Claims 42-43 have been added.

Claims 1-10, 13-17, 20-23, 25-30, and 32-43 are now pending.

Rejections Under Section 112

Claim 14 was rejected under section 112, second paragraph, as being indefinite. Specifically, the claim recites the number "N" without specifying the range of "N". Applicant respectfully submits that no recitation of a range of N is required. However, in order to expedite prosecution, claim 14 has been amended to specify a range of "N".

Allowable Subject Matter

The Examiner states in the current Office Action that claims 8-10, 13, and 39-41 are allowed, and that claims 16-17 and 28 are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Rejections Under Section 103

Independent claims 1 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson (USPN 5129092) in view of Bui et al. (USPN 4998288; hereinafter referred to as Bui).

Independent claims 21, 23, and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Bui as applied to claim 1 above, and further in view of Inada et al. (US 2004/0004620; hereinafter referred to as Inada).

Dependent claims 2-7, 22, 24, 26-27, 30, and 32-38 were rejected under 35 U.S.C. §103(a) as being unpatentable over various combinations of Wilson, Bui, Inada, Cloutier (USPN 5892962), and Hsieh et al. (USPN 6819321).

Claim 1 recites:

A computer graphics system for generating pixels from a distributed convolution of rendered samples comprising:
a plurality of sample managers connected in series; and
a set of partial sums buses, wherein each partial sums bus connects one of the sample managers of the series to the next sample manager in the series;
wherein each sample manager is operable to calculate partial sums for a corresponding portion of the rendered samples located within a convolution kernel corresponding to a pixel location, wherein each sample comprises values for a plurality of parameters, wherein partial sums comprise partial sums for each sample parameter value, wherein the partial sums comprise 1) a sum of weights determined for locations of the rendered samples in the portion of rendered samples and 2) a sum of weighted sample values for the portion of rendered samples,
wherein each of the second through the last sample manager in the series is operable to add the partial sums calculated for its corresponding portion of the rendered samples to any previously accumulated partial sums received from the prior sample manager in the series, and if not the last sample manager in the series, output new accumulated partial sums to the next sample manager in the series.

Regarding claim 1, Wilson and Bui, either singly or in combination do not teach a computer graphics system with "a plurality of sample managers connected in series,…wherein each of the second through the last sample manager in the series is operable to add the partial sums calculated for its corresponding portion of the rendered samples to any previously accumulated partial sums received from the prior sample manager in the series, and if not the last sample manager in the series, output new

accumulated partial sums to the next sample manager in the series". Bui's Figure 2, clearly shows a system where M00 does not receive an output of partial results from M01, nor does M01 receive an output of partial results from M02. In fact, the inputs of M00, M01, and M02 are connected and their outputs are simply added together. Therefore, these units are connected in parallel, not in series. Furthermore, none of the components in Figure 2 correspond to a "plurality of sample managers connected in series" and no single unit can be identified as a "last sample manager". Wilson provides no teaching on the details of processing any partial results and provides no identifiable "last sample manager".

In addition, Wilson and Bui, either singly or in combination do not teach a computer graphics system for generating pixels from a distributed convolution of rendered samples. In fact, there is no use of either of the terms "render" or "rendered samples" in Wilson or Bui. Wilson is not only silent regarding the term "rendered samples", but is even silent regarding the term "pixel". The term sample is well known in the computer graphics art to refer to the use of "super-sampling" or "multi-sampling". Applicants specification describes these terms at page 10, lines 13-28:

> "The SM's Pixel Write Unit 815 receives samples from the RPs as input. The Pixel Write Unit 815 is responsible for outputting samples to the memory subsystem (and ultimately the memory 805). **Two possible sample generation modes are "super-sampling" and "multi-sampling."** When "super-sampling," the RP evaluates color, texture, and z value for each sample and passes the sample to the SM 800. The SM 800 passes the data directly into the memory 805. This allows "texture per sample" and "color per sample" operation.
>
> When multi-sampling, color (including texture) is evaluated for one sample per pixel, and the SM 800 expands the parameter set for the one sample into multiple samples per pixel using a sample mask and z slopes (partial derivatives of z with respect to sub-pixel x and y). For each pixel, a RP will send a parameter set for one sample including color, z value, z slopes, and a sample mask. Within the SM, the samples will be expanded and individually written to the memory 805. Sample expansion may be accomplished by replicating color values across multiple samples and interpolating z for each of the locations of the multiple samples from a z value for the one sample and slopes for the rate of change of z within the pixel."

Furthermore, Wilson and Bui, either singly or in combination do not teach a computer graphics system "wherein **each rendered sample comprises values for a**

plurality of parameters, wherein partial sums comprise partial sums for each sample parameter value". In fact, there is no use in either Wilson or Bui of the terms "parameter", "color (such as red, green, or blue)" or "transparency". Applicants specification describes these terms at page 19, lines 10-20:

> **"Sample values include RGB color values and alpha (transparency), and partial sums include partial sums for each of these parameter values....**
> In some embodiments, the last sample manager in a chain may be operable to **calculate parameter values** for a pixel from the final accumulated sums corresponding to **each sample parameter value**...".

In addition, Bui teaches that a pixel has a single value at col. 1, lines 54-62:

> "Each kernel can be masked by a predetermined matrix of coefficients to replace the kernel at a central location, for example, with a **single composite value** that tends to smooth the image and substantially eliminate single-pixel noise, which might otherwise show up in the reproduced image as undesired blips of non-correlated noise (e.g., white or "snow"). In this manner each pixel is compared with its surrounding neighbors and appropriately adjusted."

Regarding claim 2, Wilson and Bui, either singly or in combination do not teach a computer graphics system "wherein the last sample manager in the series calculates normalized pixel values by dividing a final accumulated sum of weighted sample values by a final accumulated sum of weights".

Therefore, Applicant submits that claim 1, claim 2, and dependent claims 3-7 are non-obvious and patentably distinguished over Wilson and Bui for at least the reasons given above. Applicant further submits that the independent claims 14, 21, and 25 and their dependent claims are also non-obvious and patentably distinguished over Wilson and Bui for at least the reasons given above in support of claim 1.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetzel PC Deposit Account No. 50-1505/5681-59700/JCH.

Respectfully submitted,

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